Monthly IV&V Contract Progress Report
July 2004

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1 INTRODUCTION

This Monthly Progress Report was developed under Contract NASA-XY-2 in accordance with the DID-00 requirements and prepared for NASA IV&V Facility. This report contains contract progress for the following activities performed under this contract:

Progress is reported for IV&V support to NASA Programs and Projects including Project-X1 (PX1) and Project-X2 (PX2).

Progress is also reported for Independent Assessments, including Project-X3 (PX3) and Projet-X4 (PX4).

Finally, progress is reported toward the development and enhancement of tools used in the performance of IV&V tasks.

2 PROJECT-X1 IV&V PROJECT

2.1 FLIGHT SOFTWARE DEVELOPMENT

2.1.1 General

- The PROJECT-X1 Project continues to operate under an aggressive schedule. This has resulted, in part, in Flight Software (FSW) development delays. The project approved a mitigation plan that calls for the use of FSW version 4.0 in the initial system testing planned for September and version 5.0 for system testing in October and November. The project held a Software Release Authorization for Management of Risk meeting to assess and approve the risk and mitigation strategy related to the use of the untested (FQT) FSW 5.0 in system tests. This action is expected to accelerate the schedule and allow further development of FSW version 5.0. The aggressive schedule and reduced budget may impact Developer's ability to fully mitigate some risks, including those identified by the IV&V team.

2.1.2 Software Development Risks

- The PROJECT-X1 IV&V Team has documented one risk against the software development process. The following describes the risk, the IV&V recommendation, and their current status.

  1. Uncertain S/C1 Software Quality

     Description: Major portions of PROJECT-X1 S/C1 software development occurred prior to Software Development Plan (SDP) revisions 8, and 9. This may have resulted in software development inconsistencies and uncertain software quality with potential safety and reliability impacts. The PROJECT-X1 Project has captured this item as Project Risk 221.

     Recommendation: The PROJECT-X1 project should assure the X/C1 SW viability has not been compromised by development under an evolving SDP. This should be accomplished through a software and documentation audit to determine if deviations have occurred and their degree and severity. In addition, an independent audit should be considered to verify and validate internal results. The information should be used to develop mitigation priorities and plans that may include, in part, software and documentation updates.

     Current Status: The PROJECT-X1 project reviewed the potential Risk 221 on May 28, 2004 at the Risk Management Team meeting. The IV&V team will validate the potential risk using Software Quality Engineering (SQE) reports.

2.1.3 Meeting Support

- The IV&V team participated in a number of Integrated Product Team Reviews (IPTR) for S/C1 and S/C2 software changes and to review S/C1 and S/C2 Software Test Description

(STD) scripts. The test script reviews were performed in preparation for FQT dry runs, which are expected to be completed by August 23, 2004.

- The IV&V team participated in a number of developers PROJECT-X1 System Software Control Board (SSCB) meetings held on Mondays and Wednesdays through the month. The SSCB is accelerating the review and disposition of Software Problem/Change Reports (SPCR).

- The IV&V team participated in a Risk Management Team (RMT) meeting in support of potential risk 221, the IV&V software quality risk. The risk will remain as a potential risk pending the outcome of the IV&V validation assessment.

2.1.4 Significant Activities Accomplished

- The PROJECT-X1 IV&V team completed a review of the Developer plan that outlines off-nominal tests presented as mitigation for risk 220. The IV&V assessment concluded that the plan provided little details on what off-nominal testing is planned, other than negative limit testing (testing outside boundaries) planned as part of FQT. The plan included information on Integration testing and FQT testing. The integration testing indicated that the FSW group will support GN&C off-nominal testing, and will perform testing to verify requirements and commands. The GN&C model verification testing appears to stress GN&C system but not the rest of the software. The FQT testing description was focused on the verification of requirements, commands, and limits (including negative testing). The IV&V team will seek additional information to further evaluate the off-nominal software testing.

- The PROJECT-X1 IV&V team participated in a number of Integrated Product Team Reviews (IPTR) for S/C1 and S/C2 software changes and newly developed test scripts. The IV&V team made numerous contributions to the reviews that enhanced the quality of the software and improved the testing viability.

2.1.5 Planned Activities for Next Reporting Period

- Support FQT preparation activities.
- Continue risk assessment activities.

2.1.6 PROJECT-X1 IV&V Monthly Metrics

- PROJECT-X1 Metrics Report provided.

2.2 MILESTONES AND TECHNICAL REPORTS/DELIVERABLES

The table below provides a summary of recent and near-term milestones and specific deliverables.

Milestone/Deliverable	Status	Date Delivered	Date Due	Comments
Monthly Software Status Report – June 2004	C	06/29/2004	06/29/2004	NASA-X1-21-2367
IV&V S/C1 REQ V1 Analysis Report	C	07/12/2004	07/14/2004	NASA-X1-21-2368
Monthly Software Status Report – July 2004	C	07/29/2004	07/29/2004	NASA-X1-21-2371
Monthly Software Status Report – August 2004	O		08/30/2004	
Monthly Software Status Report – September 2004	O		09/29/2004	

C=Completed, IP=In Process, O=Open and on schedule, D=Delayed, CX=Canceled, R=Re-scheduled

2.3 RESOURCE MANAGEMENT STATUS

- 533M & 533Q provided for the Resource Management Status.

2.4 PROBLEMS/ISSUES

- None

3 PROJECT-X2 IV&V PROJECT

3.1 PROJECT-X2 TASK PROGRESS

3.1.1 Meetings Supported:

- Met with the Project-X2 S/C1 team for a status meeting on July 09. The Project-X2 S/C1 team gave an update on their review of the requirements traceability documents given to them by IV&V. The IV&V Project-X2 S/C1 Requirements Traceability Analysis Report is on track for the July 30 delivery.

- Met with S/C1 QA and S/C2 teams to discuss plans for the Release 1 system integration test. It was decided that there was not enough time to construct the test cases in time for the July 14 S/C1 Release 1 date. Test cases will be imported at a later date, in order to support regression testing.

- Met with the S/C2 QA team to discuss documentation of S/C2 requirements, use cases, and test cases in DOORS. IV&V has been asked to develop the requirements and traceability documentation for the S/C2 project, and to assist the S/C2 QA team with the development of level III use cases.

3.1.2 Significant Activities Accomplished:

- Continued to analyze traceability of S/C1 level II requirements to level III use cases. Continued importing S/C1 level III requirements into DOORS. The use of DOORS will facilitate the documentation of requirements traceability, and will provide a link between requirements and test cases in order to assure that all requirements are tested.

- Provided the S/C1 team level III – level IV and level IV – level V requirement traceability documents for review and update. These documents will be used for the July 30 S/C1 Requirements Traceability Report.

- Completed the final draft of the S/C1 Requirements Traceability Report. Submitted the report through the review and approval process for delivery on July 30.

- Delivered S/C1 Release 1 Requirements Traceability Analysis Report on June 28.

    ◊ As a result of this analysis, IV&V found that the S/C level V top-down changes process documents exhibited adequate traceability to S/C level IV requirements. IV&V also found that all level IV requirements relating to top-down changes capability were addressed by these process documents.

- Developed the Earned Value report for June.

3.1.2.1 Planned Activities

- Continue to support the Project-X2 Project teams.

- Continue to advise and consult Project-X2 project teams with regard to project risk assessments.

- Complete the S/C1 Requirements Traceability Report for delivery to the customer on July 30.

- Complete the documentation of requirements and traceability for the S/C1 Project in DOORS.
- Begin meeting with the S/C3 Project Team to finalize the project schedule and the tasks to be performed by the IV&V team.

3.2 MILESTONES AND TECHNICAL REPORTS/DELIVERABLES

The table below provides a summary of recent and near-term milestones and specific deliverables.

Milestone/Deliverable	Status	Date Delivered	Date Due	Comments
DTD Release 1 Requirements Traceability Report	C	06/28/2004	07/02/2004	NASA-X1-29-2370
DTD Release 2 Requirements Traceability Report	IP		07/30/2004	

C=Completed, IP=In Process, O=Open and on schedule, D=Delayed, CX=Canceled, R=Re-scheduled

3.3 RESOURCE MANAGEMENT STATUS

- 533M & 533Q provided for the Resource Management Status.

3.4 PROBLEMS/ISSUES

- None

4 INDEPENDENT ASSESSMENTS

4.1 PROJECT-X3

4.1.1 Significant Activities Accomplished

- The IAT delivered the IA Interim Report (draft) on 7/02/04. This report documented the activities and findings of the contract effort from the inception through June, and identified project artifacts required to complete the IA tasks.

- No additional activity occurred in July.

4.1.2 Meeting Support

- The PROJECT-X3 Independent Assessment (IA) Team (IAT) sat in on the weekly NASA Center PROJECT-X3 team meeting via remote dial-in on 7/13/04 and 7/20/04.

4.1.3 Planned Activities for Next Reporting Period

- No activity is planned in August, unless the Facility directs us to restart the assessment. Should the assessment be reactivated, IV&V will require access to the artifacts identified in the IA Interim Report.

4.1.4 Milestones and Technical Reports/Deliverables

The following table reflects the new deliverables (associated with the project milestone dates).

Milestone/Deliverable	Status	Date Delivered	Date Due	Comments
PROJECT-X3 IV&V Final Report	IP		July 2004	Includes activities and findings through June 2004.

C=Completed, IP=In Process, O=Open and on schedule, D=Delayed, CX=Canceled, R=Re-scheduled

4.1.5 Resource Management Status

- 533M & 533Q provided for the Resource Management Status

4.1.6 Problems/Issues

- As indicated in Section 4.1.3 above, the IAT is awaiting direction from the Facility to complete the remaining of the baseline tasks.

4.2 PROJECT-X4 IV&V PROJECT

4.2.1 Significant Activities Accomplished

- No significant activities were performed this reporting period.

4.2.2 Meeting Support

- None

4.2.3 Planned Activities for Next Reporting Period

- Support customer meetings and provide inputs for next phase when needed.

4.2.4 Milestones and Technical Reports/Deliverables

The table below provides a summary of recent and near-term milestones and specific deliverables.

Milestone/Deliverable	Status	Date Delivered	Date Due	Comments
TBD				

C=Completed, IP=In Process, O=Open and on schedule, D=Delayed, CX=Canceled, R=Re-scheduled

4.2.5 Resource Management Status

- 533M & 533Q provided for the Resource Management Status.

4.2.6 Problems/Issues

- None.

5 NASA-XY-2 MANAGEMENT STATUS

5.1 GENERAL

5.1.1 Significant Activities

- The NASA Center X has requested support from the IV&V Facility on the PROJECT-X2 to evaluate open issues on PROJECT-X2 S/C2. The Task Order for this effort was developed and responded to in this period. The effort is scheduled to commence in September.

- The PROJECT-X1 project was extremely pleased with the additional analysis we supplied and requested even more IV&V to be performed. They also told IV&V Facility Management in the last review how pleased they were with our additional effort.

- Scheduled the next IV&V Facility Management review for Wednesday, August 18 in our New City, XY office.

- Interviewed several personnel to fill the open position in the PROJECT-X3 analysis team.

- The analyst who performed the IV&V analysis on PROJECT-X2 was invited by the PROJECT-X2 project to attend the launch.

5.1.2 Planning Activities for Next Reporting Period

- Continue to work on implementing the new test process for the PROJECT-X1 work.

- Support the NASA Center X initiatives, as needed.

5.2 COMMUNITY OUTREACH

- No significant activities this period.

5.3 MILESTONES AND TECHNICAL REPORTS/DELIVERABLES

The table below provides a summary of recent and near-term milestones and specific deliverables.

Milestone/Deliverable	Status	Date Delivered	Date Due	Comments
533M for April 2004	C	05/14/2004	05/14/2004	
533Q for May 2004	C	05/10/2004	05/10/2004	
Monthly Contract Progress Report – May 2004	C	05/28/2004	05/28/2004	
533M for May 2004	C	06/14/2004	06/14/2004	
Monthly Contract Progress Report – June 2004	C	06/29/2004	06/29/2004	
533M for June 2004	C	07/15/2004	07/15/2004	
Monthly Contract Progress Report – July 2004	O		07/29/2004	

Milestone/Deliverable	Status	Date Delivered	Date Due	Comments
533M for July 2004	O		08/13/2004	
Monthly Contract Progress Report – August 2004	O		08/30/2004	

C=Completed, IP=In Process, O=Open and on schedule, D=Delayed, CX=Canceled, R=Re-scheduled

5.4 RESOURCE MANAGEMENT STATUS

- 533M & 533Q provided for the Resource Management Status.

5.5 PROBLEMS/ISSUES

- None